5-1978

A Transport Center for Bloomington-Normal, Illinois

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Clemson University

A TRANSPORTATION CENTER FOR BLOOMINGTON-NORMAL, ILLINOIS

A Terminal Project Submitted to the Faculty of the College of Architecture, Clemson University in Partial Fulfillment of the Requirements for the Degree Master of Architecture by

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Committee Chairman

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Dean, College of Architecture

May, 1978

DEDICATION

To my Family and Miss Susanna Vitale.

ACKNOWLEDGEMENTS

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Frederick G. Roth	Chairman of Terminal Project Committee
David Hutchinson	Committee Member
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INTRODUCTION

The intent of this terminal project is to design a transportation center to serve the cities of Bloomington and Normal, Illinois. The suggestion for this project comes from a report by Carl R. Englund, Jr., transportation consultant. Mr. Englund states, "The most advantageous arrangement presumably would contemplate the establishment of a well-rounded transportation center which also would include city bus service, taxi dispatchment, and a union terminal for intercity buses."[1] An Amtrak rail terminal would round out and complete the concept of a total Transportation Center.

The importance of a Center to combine rail, intercity bus, city bus, and taxicab dispatchment lines in its effective coordination of various modes of travel. By providing a successful interchange, the

Transportation Center will create a system which is efficient, economical, safe, and responds to the environmental needs of the users.

Figure 1 shows the 7 vehicles involved in the Center. The potential for the interchange of people, goods, and services is the underlying theme of the Transportation Center.

7 Vehicles entering the Center

train
intercity bus
automobile
public transit bus
shuttle bus
taxi
service

Classifications

drop-offs

public transit bus
shuttle bus
taxi

stay-a-whiles

intercity bus
service

both

automobile

separate

train

Figure 1: Vehicle Identification and Classification

BACKGROUND DATA

BLOOMINGTON-NORMAL, ILLINOIS

The cities of Bloomington and Normal are located in Illinois in the Mid-Western portion of the United States (see figure 2). Their latitude is 40'30" and their longitude is 89'00". They are situated 125 miles southwest of Chicago, Illinois. The metropolitan population of these cities was 92,334 in 1967, and is projected to grow to 158,600 by 1990, an increase of 63 percent.

The cities lie in the rich agricultural praire land of the Midwest, characterized by a vast horizon line, relatively few trees, and extreme seasonal differences in temperature. One of the major crops produced in the area is corn.

As might be expected, many of the cities' products are farm related. Ralston Purina Company and Funk

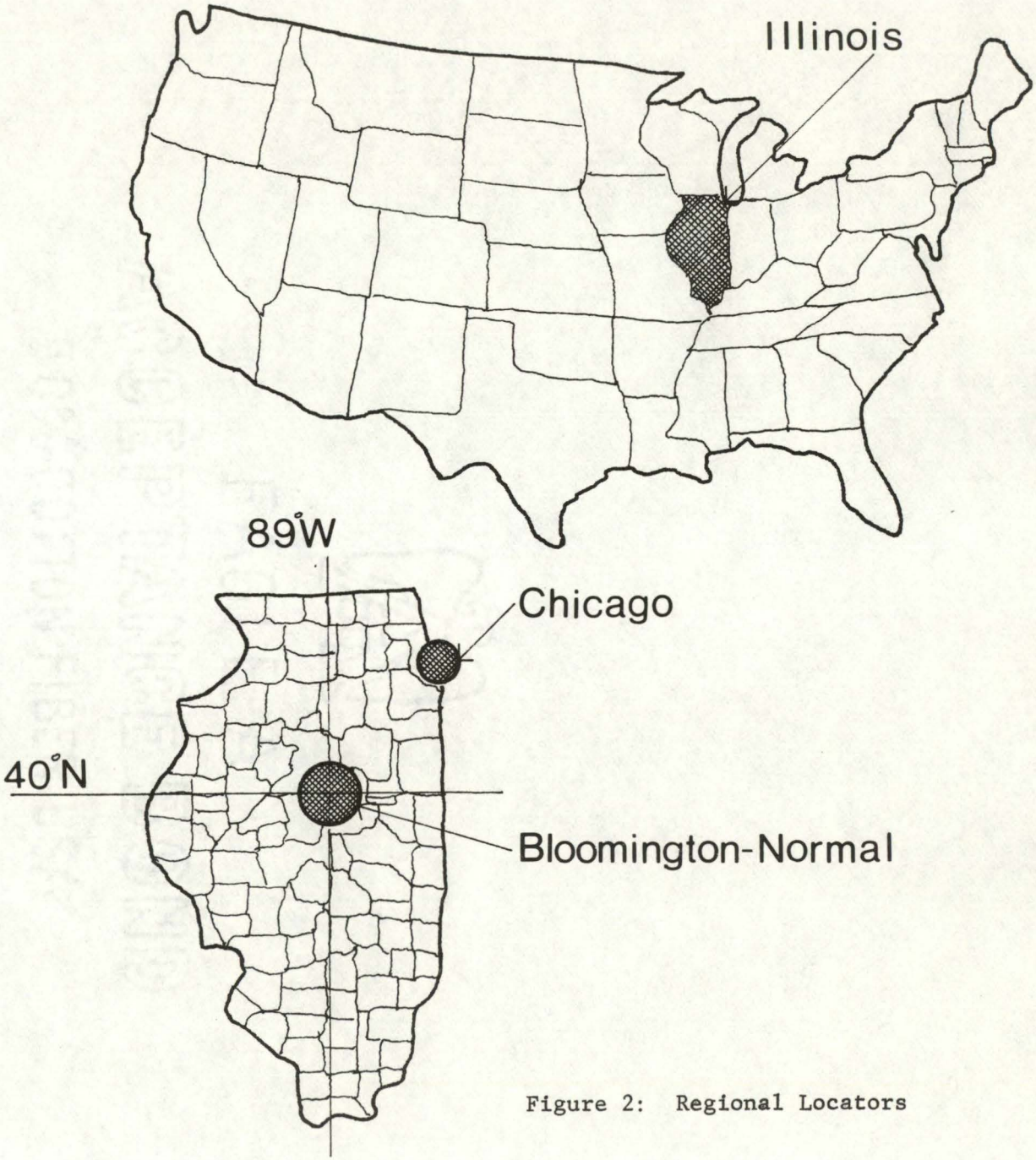


Figure 2: Regional Locators

Seeds International Incorporated are both located in Bloomington. State Farm Insurance Company, located in Bloomington, is the major metropolitan employer with over 4,000 people.[1] Illinois State University, located in Normal, is the second largest employer in the area. In the building products sector of business, there are Alexander Lumber Companies, Builders Supply Company, and the Fabral Corporation. These companies handle, respectively, wood products, concrete products, and metal roofing.

The town of Normal was named after "the Normal School," or teachers college, which was located there. Its name is derived from the Ecole Normale Superievre and was intended to serve as a model for other teacher-training schools. The history of Bloomington as a settlement dates back to 1822. In 1831 the town of Bloomington was platted.[2] It became incorporated in 1950 and established a council-manager government in 1953.[3] It currently has this type of governmental

organization. Among the famous statesmen that came from Bloomington were United States Vice-President Adlai E. Stevenson, and Supreme Court Justice and Senator David Davis. Among the lesser known accomplishments of the cities are the birth of the "Steak and Shake" fast food enterprize and the establishment of the "Beer Nuts" organization.

URBAN TRANSPORTATION

Transportation is defined as "...the movement of people and goods between activities which are separated in space."[1] Transportation allows people the opportunity to participate in business, recreational, cultural, health, and educational endeavors. Various mechanical means of transportation may have detrimental effects. These are: accidents, congestion, inefficient investment, inaccessibility, ugliness, strain and discomfort, noise and nuisance, and air pollution.[2] The major catalyst to these ill effects has been the American public's dependence on the automobile. Eighty percent of all households in 1975 in the United States have at least one car.[3] The other 20 percent have two or more, and people spend about twice as much each year just to register their cars as they do to ride buses and subways.[4]

The reason for the great number of automobiles (over 100 million) is that it is in a great many ways superior to any other mode of travel.

Wilfred Owen of the Brookings Institution lists the advantages of the automobile: "It offers comfort, privacy, limited walking, minimum waiting, and freedom from schedules or routing. It guarantees a seat, protects the traveler from heat, cold, and rain. (It) provides space for baggage, carries extra passengers at no extra cost; gets there faster and cheaper than any other way."[5] The automobile has fostered an interesting problem in addition to those mentioned. This is the requirement of large areas of land and energy. Currently the United States has over 3 million miles of roads and streets alone.[6] Passenger travel takes up more than 50 percent of all of the petroleum used for transport.[7]

The automobile has had a major effect on the planning and design of today's cities. This has led to our cities being, "spatially arranged to accommodate the automobile."[8]

The design with rare exceptions has been developed assuming everyone drives. Those who cannot (the elderly, the young, the disabled, and those with low income) are denied the benefits automobile travel can bring. Those who can drive have encouraged the use of freeways and beltways to connect their outlying communities with the inner city and with each other. Public transit has nearly been left by the wayside. The number of transit rides in 1974 (5.6 billion) was close to the lowest number recorded since the turn of the century.[9]

There are solutions to the transit problems caused by the automobile. Substitution of another type

of vehicle other than the automobile alleviates potential accidents. The use of a shuttle bus, especially in university settings, has proved successful in conveying people more efficiently than the automobile.

It should be noted that changes must recognize the entire transportation system and environmental concerns. "Changing the environment and the location of jobs and housing may save as much energy as riding the bus."[10]

THE RAILROAD STATION

The Railroad Station is a building which has certain characteristics typical of any transportation facility. There are three major areas which are relevant to the development of the train station. These are circulation expression, material and technological applications and certain characteristics of form which make the train station identifiable.

The circulation expression of train stations was quite incidental in it's early years. The major emphasis was on housing the train. In fact passengers were separated from the station until the moment of departure. They were usually housed at Inns.[1] Ticket purchasing was also handled there.

This lack of organization was also reflected in the "design" of the early stations. The first attempt

to reduce the confusion occurred in 1846 by Cesar Daly (see figure 3).[2] The most enduring and straightforward circulation system is the one sided combination type. It is characterized by the station being located on one side of the tracks and the use of the station's eave as a canopy. This type is used primarily in the small to intermediate sized stations.

The one-sided combination type had the advantage of not breaking with tradition and most always was the least expensive solution for small stations.[3] The walking distance was also minimal. However, as schedules increased and the volume of people multiplied, this solution became endangered. In addition, the conflict of pedestrians crossing the tracks led to serious safety hazards. This common problem of conflicting circulation flows was eventually solved by using pedestrian tunnels or bridges.

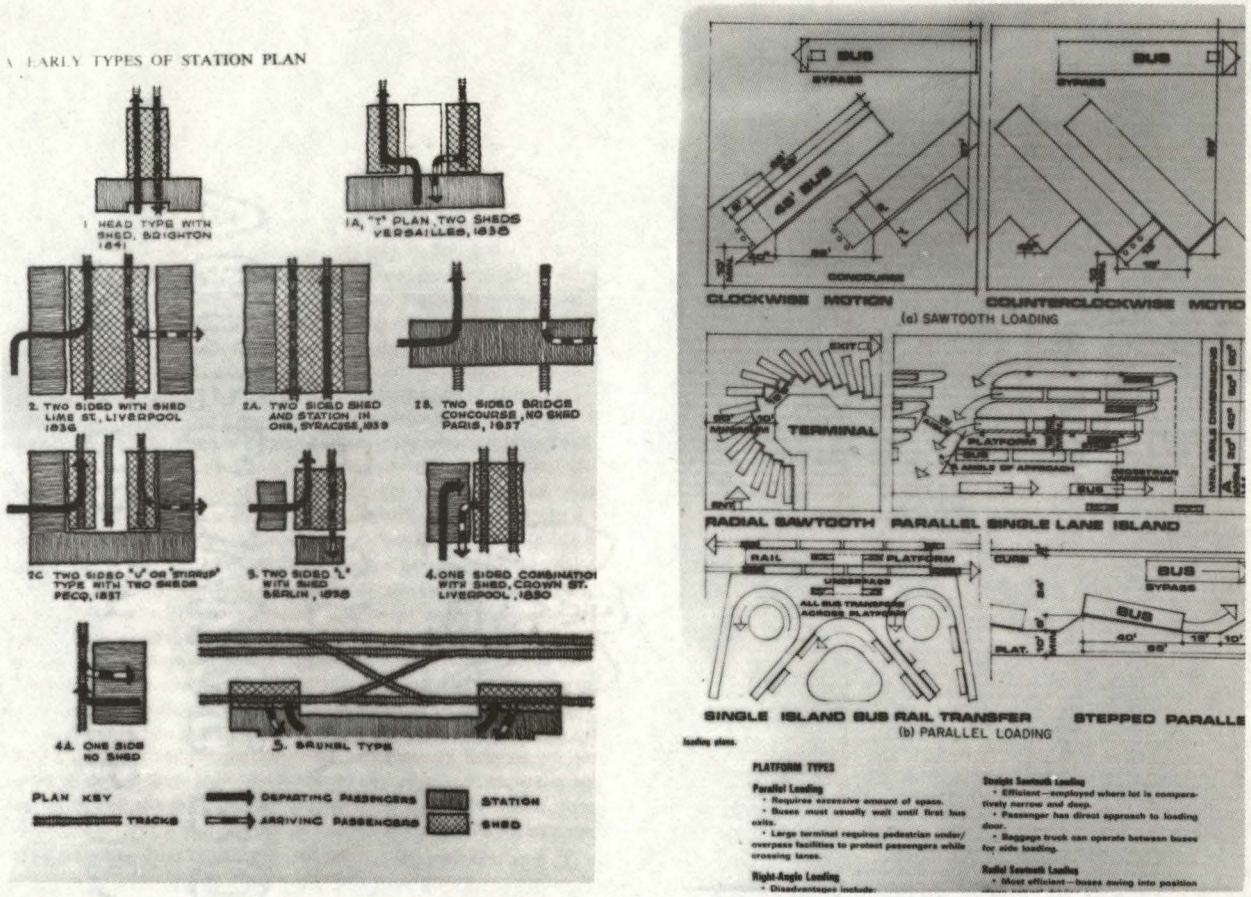


Figure 3: Typical Layouts for Train and Bus Platforms

The two sided station (see figure 3) was very popular because of its separate arrival and departure platforms. The major disadvantages that led to its discontinued use were inflexibility and the long distances the passengers had to walk.[4]

The two-sided station succumbed to a superior solution, the head type (see figure 3). The circulation of this type is the most efficient, allowing the passengers access to many trains with the least amount of interference. This type led to the development of the concourse. The concourse allowed direct ingress for arriving and direct egress for departing passengers and eliminated the need for separate docking areas. A disadvantage of the concourse is the need to reverse the trains out of the station.

The second major area of concern is the use of materials and technology. The most common building material in the early stations was wood. It was discontinued

because it deteriorated from the exposure to the engine's sulphurous steam. It also was vulnerable to fire and required frequent repair.[5] The use of metal spanning members and supports allowed longer spans. The race for the longest span in a train station (300') culminated in the Broad Street Station in Philadelphia.

In the early 1900's the railroad lost its unrivaled post as the major transportation mode. Modern conveniences such as air-conditioning and escalators were used as promotional items to try and improve a declining market for train travel. The last stage of railroad station design is the expression of structural clarity and the effort to convey an image of swift travel. The use of steel and glass has played an important role in this objective.

The final area to be discussed are the characteristics of form which identifies the train station.

The first of these items is the outdoor covering which protects the traveler and the building from the sun and inclement weather. In many small stations, the knee brace was used extensively for this purpose. The second item is some type of information device. In early stations, a bell and clock, located in a campanile were a common feature. The train board has virtually eliminated the campanile. The modern public address system allows the passenger more freedom, and still provides him with the necessary information.

In closing it should be noted that there are over 80,000 railroad stations in the United States today.[6] At one time or another they all possessed that one unmistakable attribute: "Romance has always endowed the railroad with a mixture of wonder, astonishment, and awe."[7]

AMTRAK

The National Railroad Passenger Corporation (Amtrak) began operating on May 1, 1971 following the passage of the Rail Passenger Service Act of 1970. The corporation was to be "a self-sustaining, for profit quasi-public corporation."[1] Its main intent as some see it was to "bring back the glory days of trains."[2] Amtrak has made some interesting progress in its short history. In 1974 it handled over 18 million passengers, an increase of 10% from 1973.[3] However, Amtrak's major setback has been its debts. In its first five years, Amtrak has gone into the red by close to $2 billion.[4] One of the reasons for this debt is worn track. It has been estimated that it will cost over 1.6 million dollars to rebuild the 621 mile Northeast Corridor roadbed alone.[5]

Station design is very important to Amtrak. The need to maintain Amtrak's identity as Amtrak is a foremost concern. They want to convey an image of sleek, exciting travel with a reassurance that the passenger will arrive and depart safely and on time. Expansion is a necessary element. Material selection must definitely consider durability and aesthetic qualities. Efficiency in the circulation of people is a significant element. Maintenance should be kept to a minimal level. Lighting is important for security reasons. Adherence to the Occupational and Safety Health Act (OSHA) regulations is mandatory. Identifiable graphics and acceptable queuing distances are also important. A kiosk, located on the platform, should provide information and act as a reminder that the passenger is in an Amtrak station.

Essentially, an Amtrak station should be of a high design quality and should have a generous budget to achieve this quality.

UNION BUS

The Union Bus Company is presently located at 523 North East Street in Bloomington. They handle 30 buses a day at the facility. There are 3 bus lines represented: Greyhound, Illini-Swallow, and the Peoria-Rockford line. The station has 5 stalls to accommodate the flow of 30 buses daily. Additional buses on Friday and Sunday handle the demand from Illinois State students.

As opposed to the corporate structure of Amtrak, Union Bus is managed by Mr. Gene Gilleseppe with assistance from his son, Jack. The company, via Mr. Gilleseppe desires an image of friendly service. Emphasis on natural light, planting and material finishes was stressed.

TRANSPORTATION & PLANNING IN BLOOMINGTON-NORMAL

Bloomington-Normal, located midway between St. Louis and Chicago, enjoys an excellent regional market. The Interstate Highway links are routes 55 and 74. Within the Metropolitan Area the hierarchy of the streets and highways are illustrated in figure 4. In 1974 the McClean County Planning Commission developed the 1990 Street and Highway Plan for Bloomington-Normal and its environs. A one way couple, two streets designated one way in opposite directions, is proposed for Center and Main Streets. Center Street is adjacent to the site of the proposed Transportation Center. The reason for this is to, "facilitate the development of a pedestrian oriented central business district."[1] The Center Street couple will have 3 lanes of traffic and a speed limit of 25 miles per hour.

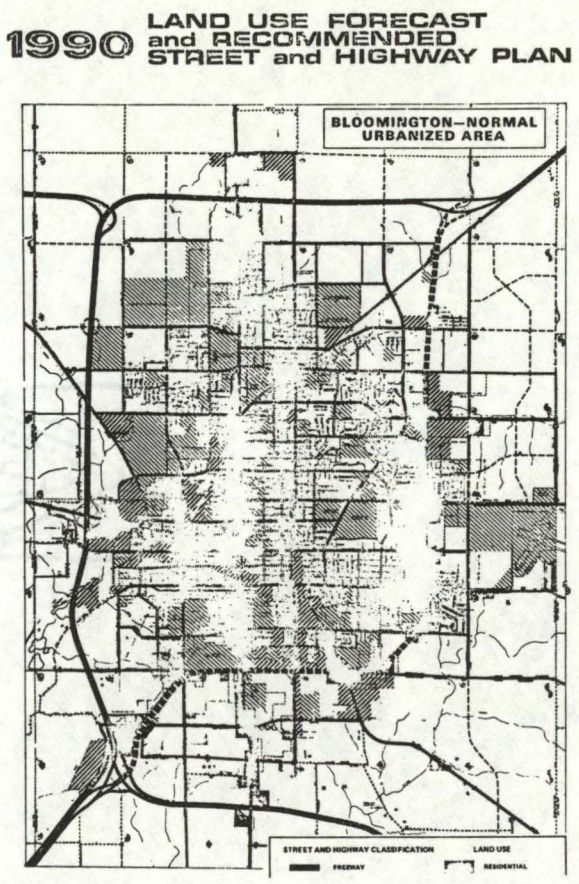


Figure 4: 1990 Street and Highway Plan

The cities enjoy a very efficient Public Transit System. In 1975 a new fleet of beige colored buses, costing approximately 1.2 million dollars, started operation.[2] The bus routes are shown in figure 5. Bloomington-Normal's Union Bus Company handles three bus lines: Greyhound, Illini-Swallow, and Peoria-Rockford. Thirty buses stop at the present station on a daily basis. On Friday and Sunday several additional buses are dispatched for the Illinois State University students. These buses pick up the students at the University Field House. Twin City Cab is the only cab company in the area and is demand responsive.

Presently, there are three railroad lines in the Metropolitan Area. These are the Peoria and Eastern (Penn Central), the Nickel Plate (Norfolk and Western) and the Illinois Central Gulf. The Illinois Central Gulf line is the only passenger line. Formerly the Bloomington Railroad Station hosted 38 daily

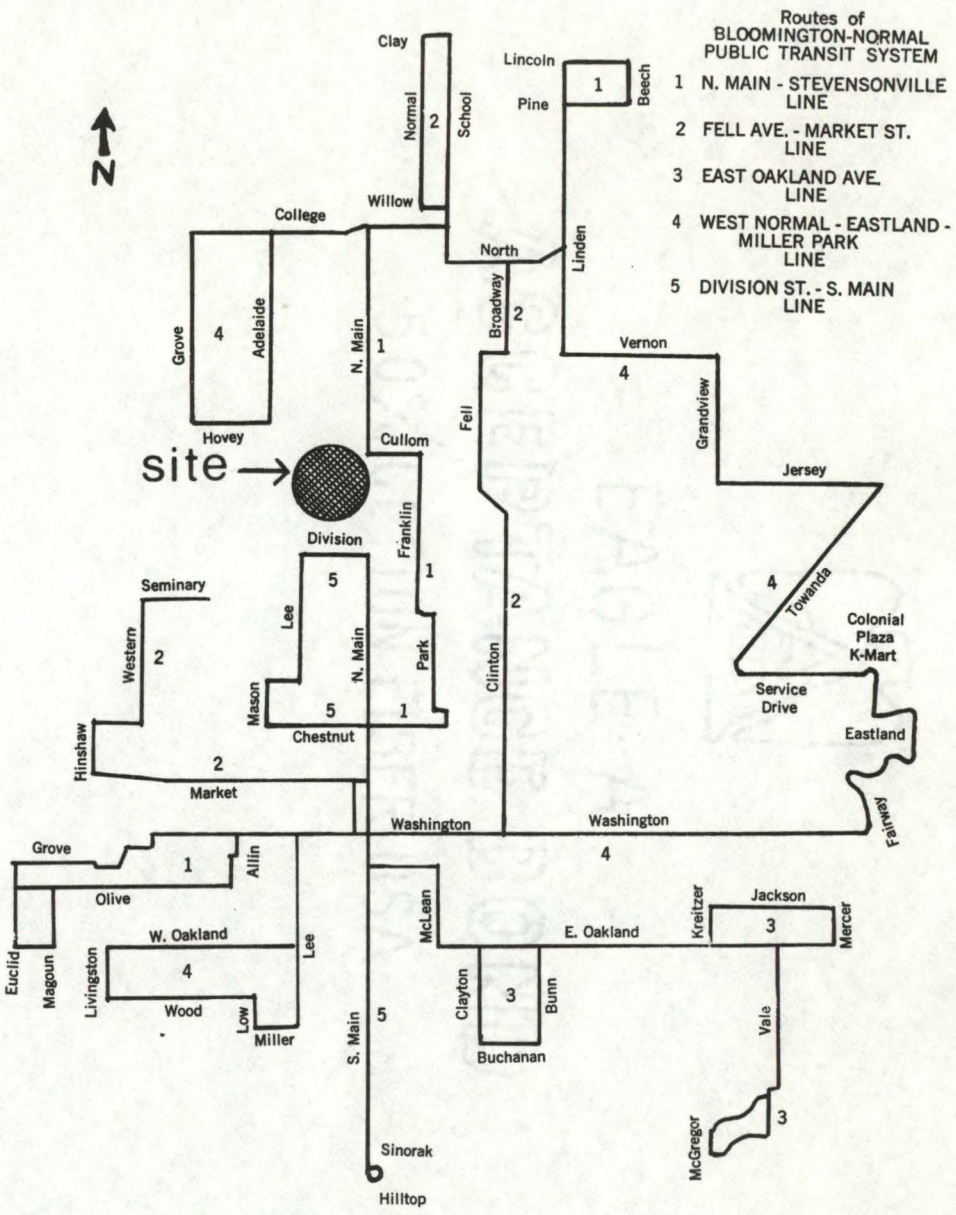


Figure 5: Public Transit Bus Rates

passenger trains plus special and extra train routes.[3] Currently their service density is six trains a day, seven days a week. It is interesting to note that the present Amtrak Route through Bloomington was the first line in the nation to have sleeping cars and dining cars as part of their regular passenger service.[4]

SITE DATA

SITE SELECTION

The selection of this site is based entirely upon the report done for the Illinois Department of Transportation by Carl R. Englund, Jr. The site is located 2 blocks west of Main Street where Virginia Avenue, if extended, would intersect the railroad right of way (see figure 6). After a review of possible Amtrak Station location studies and certain marketing considerations, Mr. Englund came to the following conclusions about the Virginia Avenue site:[1]

1. It is reasonably near to two major traffic generators, downtown Bloomington and Illinois State University.

2. It would require the least added intercity bus mileage if the Union Bus Station were to be transferred to the site.

3. It has the lowest sum of taxi fares to and from 10 major traffic origin/destination points.

4. If the acreage proves to be sufficient after Main Street is converted to dual lanes, all ground transportation services in the area will

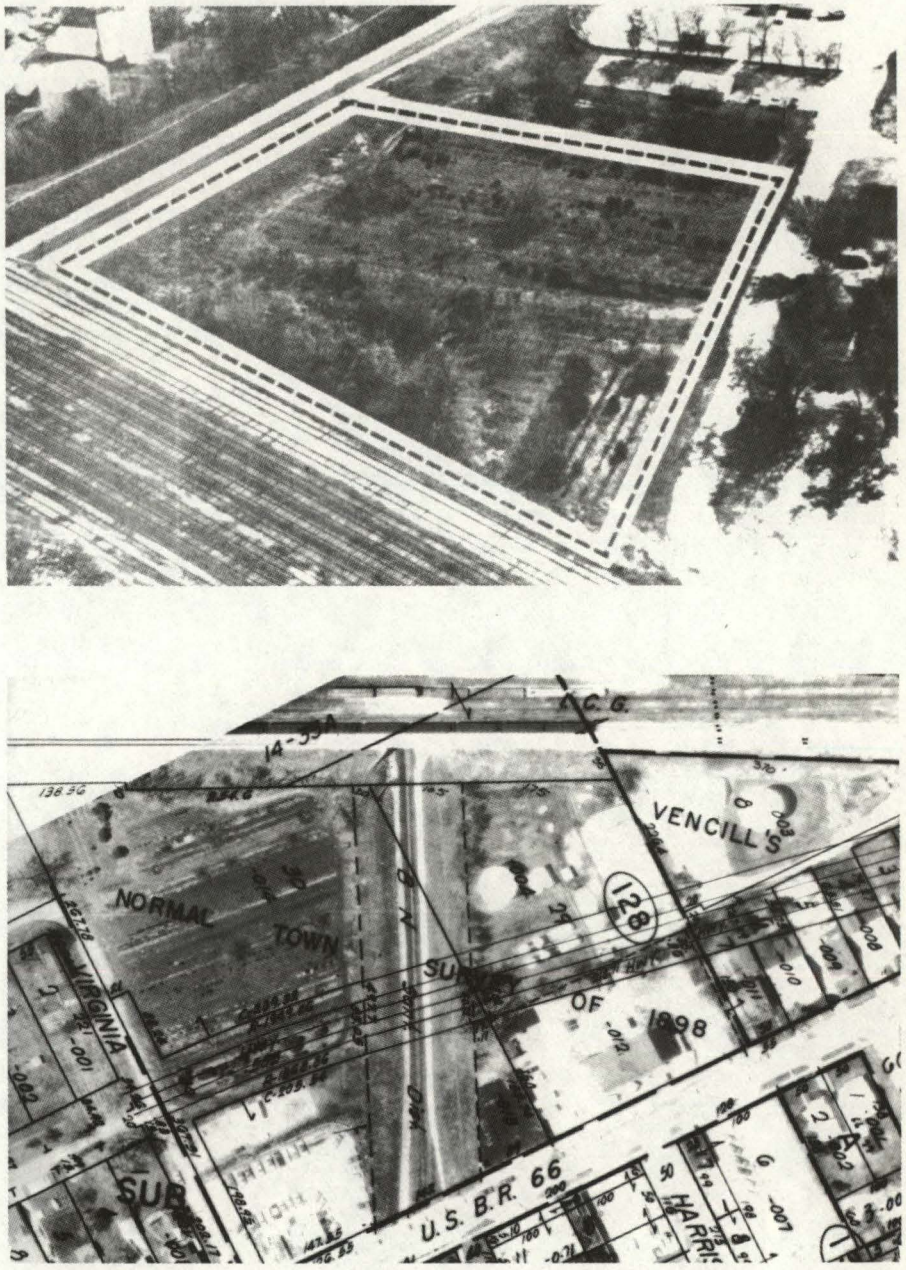


Figure 6: Location of Site

be centrally located. Selection of this site also should include attempts to relocate fuel tanks now on adjacent properties.

The distance to the four key points in Bloomington-Normal (Main Street, Main Street between Washington and Jefferson, Eastside Routes 9 and 66, and Main and College Avenues) was the lowest for the Virginia Avenue site of the five sites considered. Specific data on the selection of the Virginia Avenue site can be found in the Appendix.

ANALYSIS

The site's most significant characteristics are its access, neighborhood context, and topography. Other minor points are listed in the Appendix.

The primary circulation route for automobiles, intercity bus, and public transit will be Route 51. It is currently under construction and is planned as a 3 lane, southbound only, permanent road. Its purpose is to speed the flow of traffic to the downtown core. Virginia Avenue, a 2 lane unpaved road, will cross Route 51 at the South-East corner of the site. The Railroad right-of-way extends south-west to north-east along the west side of the site. Eight sets of tracks, currently used for box car storage, are located west of the two active rail lines. Consideration of the future use of these eight lines suggests some interesting possibilities for expansion of the present passenger

service. A bridge, located at the north-westerly most point of the site, carries all 10 sets of tracks, and spans Sugar Creek. It is 30 feet from the top of the rails to the water level of Sugar Creek.

"Steak and Shake," a fast food enterprise, is located to the east of the site. This particular building is the first of a chain started in 1936. The entire strip north and south of "Steak and Shake," is foreseen as a commercial strip. This strip is bound by Route 51 and Main Street. To the south of the site, lies Lincoln Oil Company and a residential neighborhood. Lincoln Oil Company's fuel tanks are approximately 150 feet from the site[1] and an effort should be made to usually protect the site from these tanks. Short range plans for the Center should not hinder the existing residential neighborhood, and long-range plans should have regard to the envisioned residential status of the

land to the south-west. A green strip separates another residential unit from the 10 sets of tracks on the west side of the site. The relocation of fuel tanks across Sugar Creek has left that area vacant. Possible acquisition of this land could be of benefit to the project for more controlled circulation.

From a relatively level surface at 760 feet the site rises to 774 feet along the railroad track berm and drops to a level of 744 in the middle of Sugar Creek. Sugar Creek is an open storm drainage sewer located immediately north of the site and flows in a north-westerly direction. Having an unpleasant odor, Sugar Creek has a seasonal high water level of 761 feet.[2] The grade level of the Center will need to rise above this level and measures to contain any flood levels of the creek should be undertaken.

Typical of the midwest, a climate of hot summers (upper 90's) and cold winters (below zero) prevails in the area. Tornadoes and violent thunderstorms are a threatening summer hazard. Low pressure centers with their associated weather fronts are the cause for frequent changes in temperature, humidity, cloudiness, and wind direction.[3] Annual precipitation has varied from 25 to 50 inches. The solar angle information is listed in figure 7. The annual growing season (last spring freeze to the first fall freeze) is approximately 172 days, or nearly one-half of the year.

Solar Angles for 40° N. Latitude

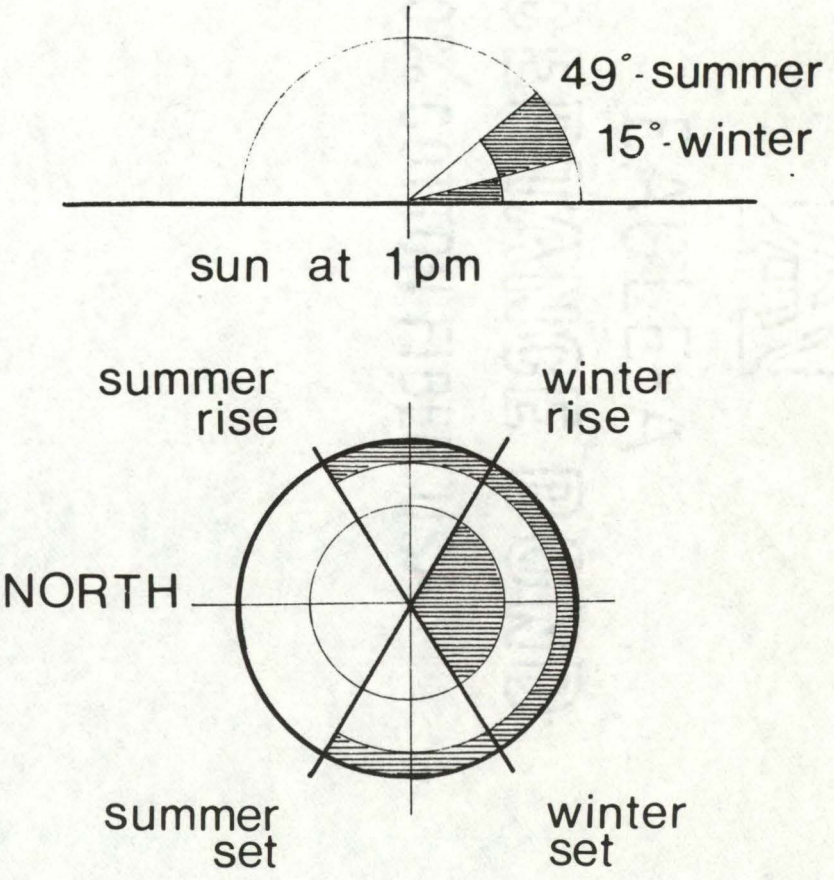


Figure 7: Sun Angles

PROGRAM DATA

USER & ACTIVITY PROGRAM

There are two general categories of users; the public and the staff. The major public areas include the concourse, the waiting room, the coffee shop, and the platform. The major staff areas are the ticket and information counters, the agent's office, the staff lounge, and the baggage room.

The concourse should have direct access to the platform. This space should have proper lighting and its floor should provide good traction and be of a durable material. The concourse is the major linking element of the entire Center. The coffee shop should be in close proximity to the rail platform. The platform should have a canopy covering at least one-half of its length. The canopy should be a minimum of 8'-0" in height and its supports should be 6'-0" from the edge of the platform.[1] The plat-

form width should be 12'-0" wide and at a distance of 5'-7" from the center line of the tracks. A 2'-6" by 2'-0" inspection pit should run along the edge of the tracks. The platform should be 4'-1" above track level. Any stairways or escalators leading to the platform should be a minimum width of 5'-8". The minimum width for a bus platform is 10'-0". Clearance for an intercity bus is 14'-0".

The ticket and information counters should be open unlike the old cage type. Ticket counters should have a height of 40", while the information counter should be 42". Both counters should have a space behind them for graphic display. The agent's office should have a private toilet and have sufficient space for files. The baggage area should be close to the platform and have sufficient space for bag storage.

The other spaces in the Center such as men's and women's toilets, and the mechanical room should follow standard design principles and guidelines. The Codes used in the area are the National Safety Codes, the Building Officials and Code Administrators (BSCA) Code, and the Building Code for the cities of Bloomington and Normal. In addition, provision for the disabled under the OSHA regulations is mandatory.

SPATIAL REQUIREMENTS

Figure 8 lists the spatial requirements for the Transportation Center. The Englund report and conversations with Mr. Gene Gillesppe, manager of the Union Bus Company, establish that 800 persons (primarily students) make up the peak volume of traffic. The peak period for these students is on Friday afternoon. For the present Amtrak Station, located in Bloomington, the estimated outbound flow as determined by ticket sales for the period of January to November, 1977 is 140 persons/day.[1] Due to round trip purchasing, actual pedestrian flow would be 280 persons/day.[2] Specific traffic volume for for the train station is given in the Appendix.

It will be assumed that 60% of the peak hour traffic volume (480 persons) will be using Amtrak. Consequently, the remaining 40% (320 persons), will be

travelling by bus. Actual percentages would primarily depend on schedules and fares. These figures were the basis for the square footages listed in Figure 8.

Spatial Requirements

Figure 8

		AMTRAK	UNION BUS
Public	waiting	3,000	1,000
	coffee shop	900	600
	ticket queue	450	200
	toilets	280	280
Staff	tickets	400	200
	agent's office	300	150
	dispatcher's office		150
	baggage	600	300
	lounge	150	200
	kitchen	200	150
	janitor	50	50
		9,330	3,280
Public & Staff			12,610
Support	Mechanical		500
	Equipment/1 elevator		70
	2 escalators		480
Gross Square Footage			13,660
Circulation Factor			X 2
Net Square Footage			27,320
Site	intercity bus		5 spaces
	public transit bus		1 space
	shuttle bus		1 space
	taxi		3 spaces
	parking		110 spaces

GOALS & OBJECTIVES

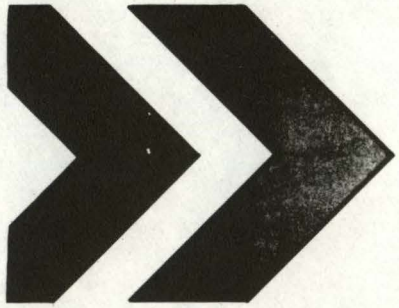
Out of the many issues involved in such a project as a Transportation Center, there are eight which are viewed as most important. These eight are circulation, safety and security, minimal maintenance, image, expansion, energy conservation, neighborhood impact, and regionalism. The reasons for choosing these stem from discussions with transportation personnel, analysis of case studies, the review of the history of transportation centers, the examination of urban transportation in general and the analysis of the Virginia Avenue site.

Goal One: Express a straight forward circulation system

Principle: Proper circulation is essential to the movement of people, goods and services. It alleviates confusion and congestion and fosters efficiency.

Goal Two:	Maintain high safety and security measures
Principle:	Safety and security protects the patrons and employees of the Center.
Goal Three:	Induce minimal maintenance techniques
Principle:	Minimal maintenance reduces overhead costs and provides for a healthy environment.
Goal Four:	Convey an image of efficient, exciting travel
Principle:	Proper image conveys confidence in a system and induces patrons to continue their patronage.
Goal Five:	Allow for expansion
Principle:	Expansion must be planned for to avoid complications in circulation, structure and aesthetics.
Goal Six:	Conserve energy
Principle:	The conservation of energy is essential due to increased demands on fuel supplies.
Goal Seven:	Design a welcome fit the existing neighborhood context
Principle:	Proper fit avoids awkward intrusions into neighborhood activities.
Goal Eight:	Relate to a sense of regionalism
Principle:	Regionalism conveys an identity to the building in both a climatic and cultural sense.

SOLUTION



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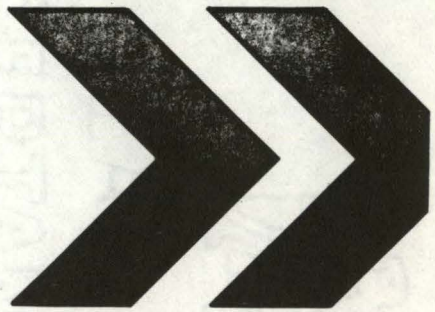

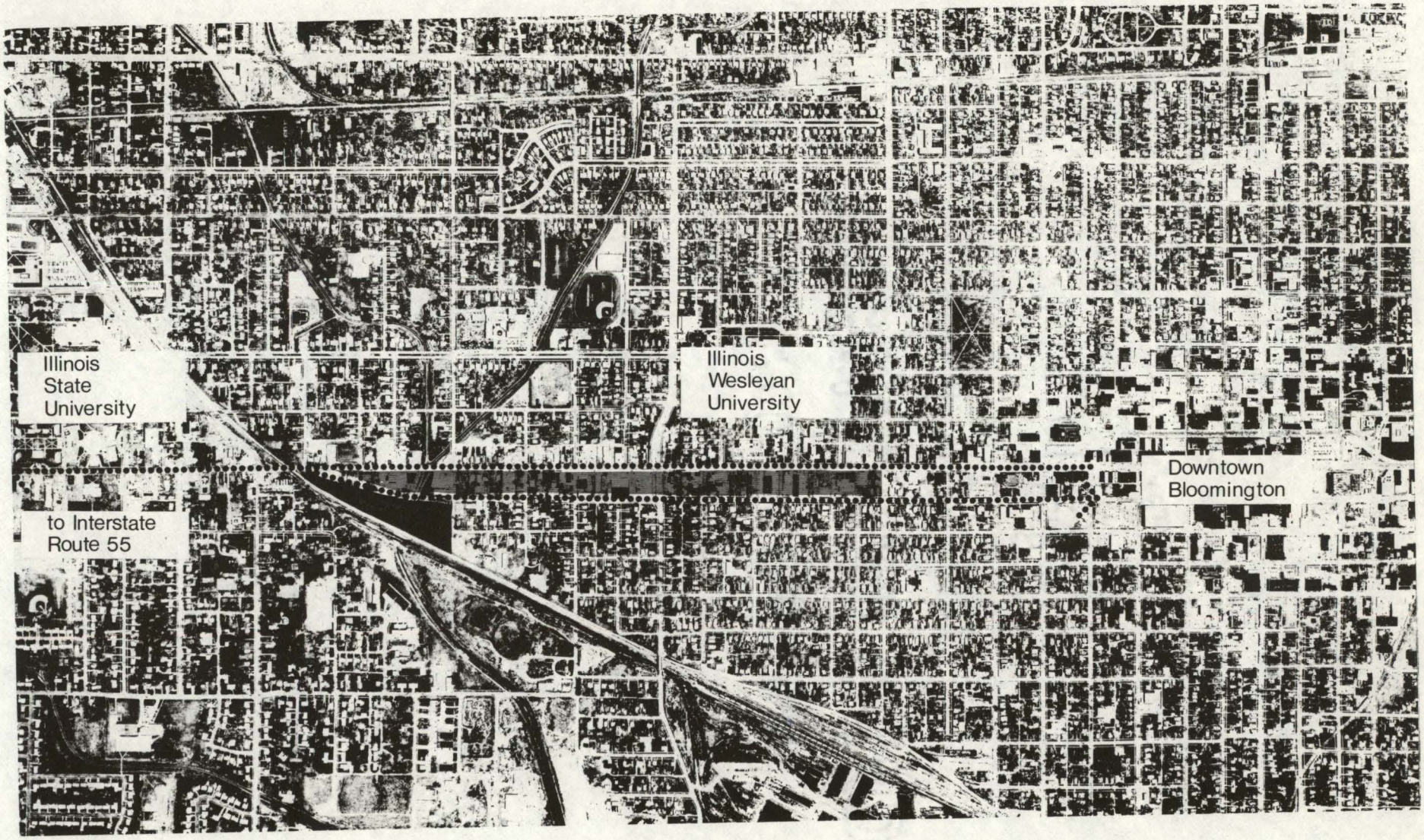
Illinois
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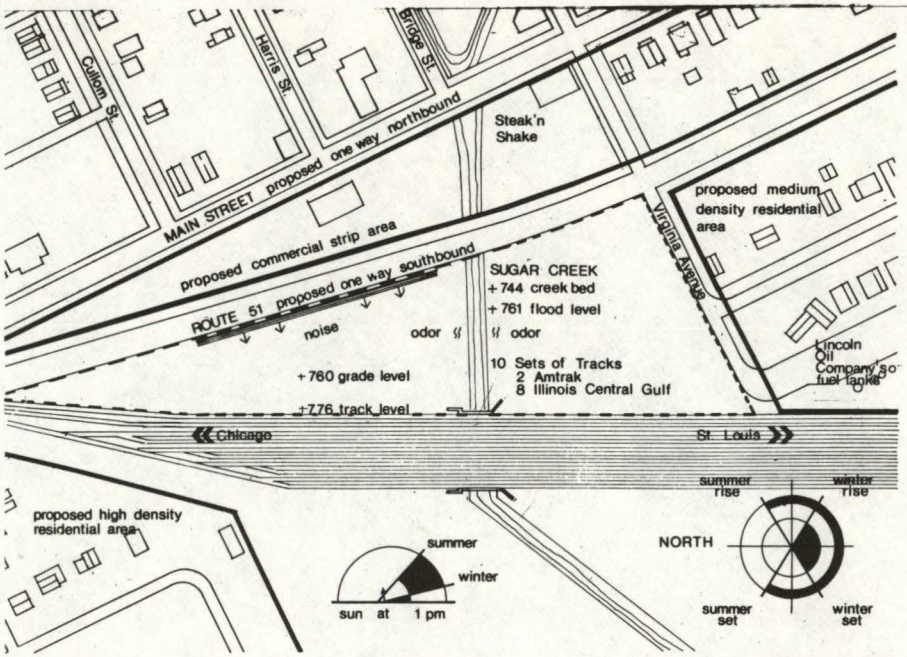

Site Analysis
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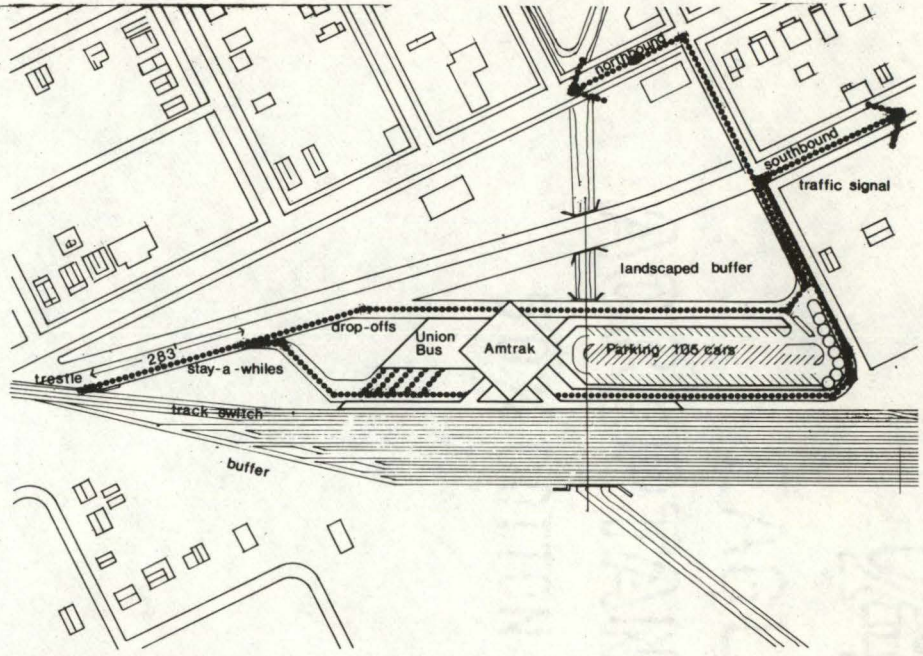

Design Concepts
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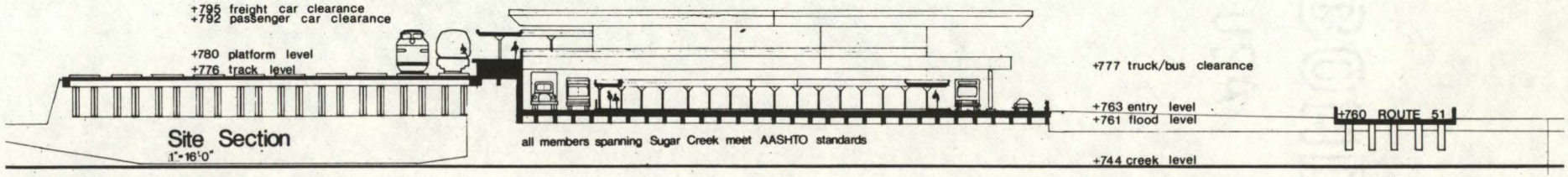

Site Section
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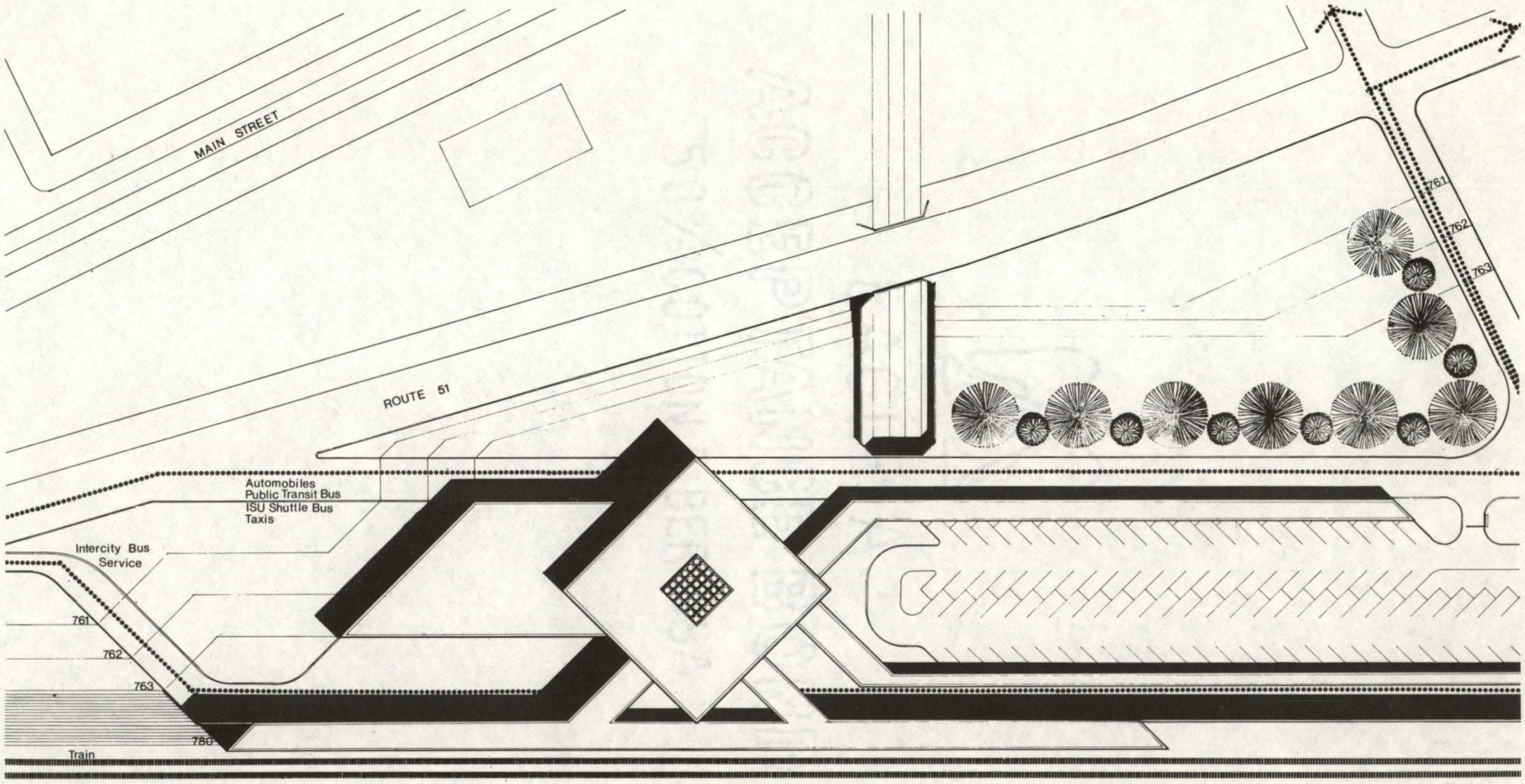
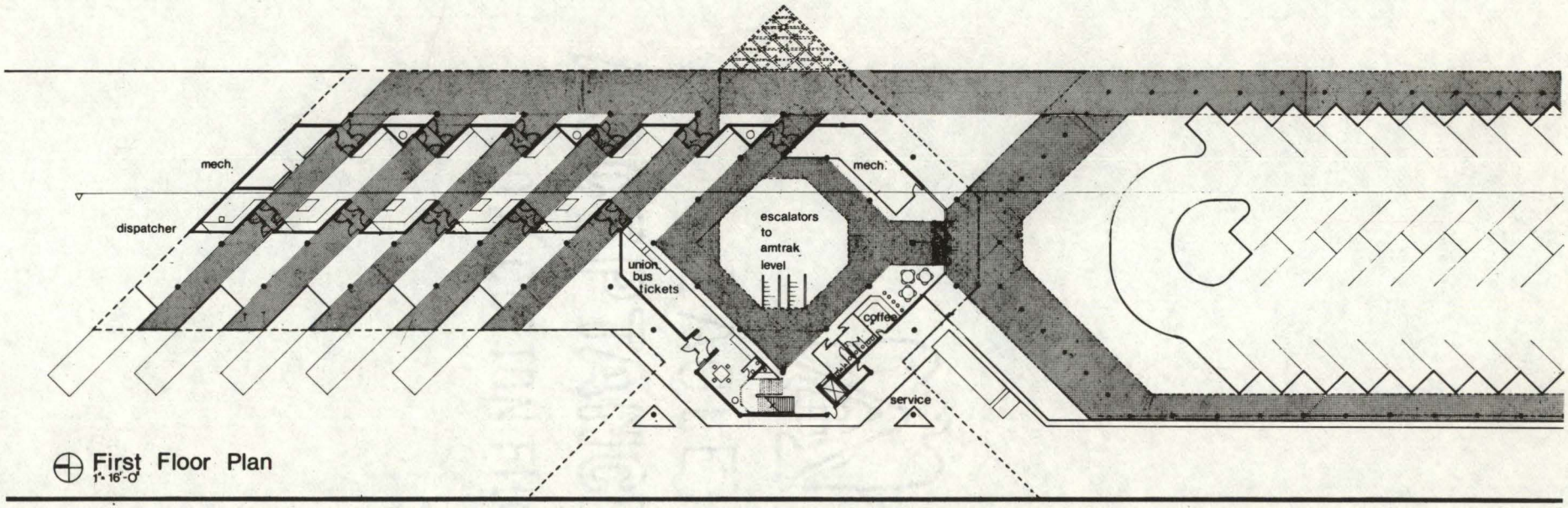
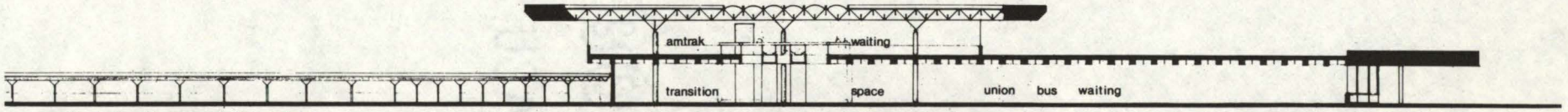


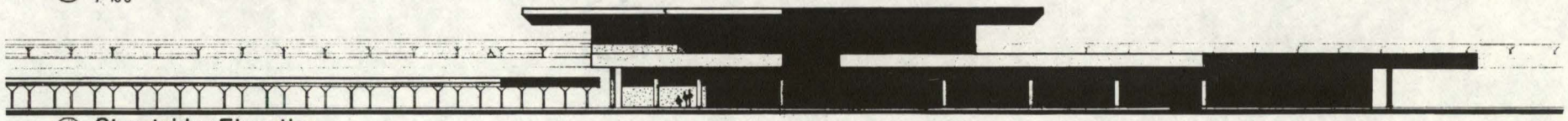
Site Plan
1"=30'-0"



First Floor Plan
1" = 16'-0"



Longitudinal Section
1" = 16'-0"



Streetside Elevation
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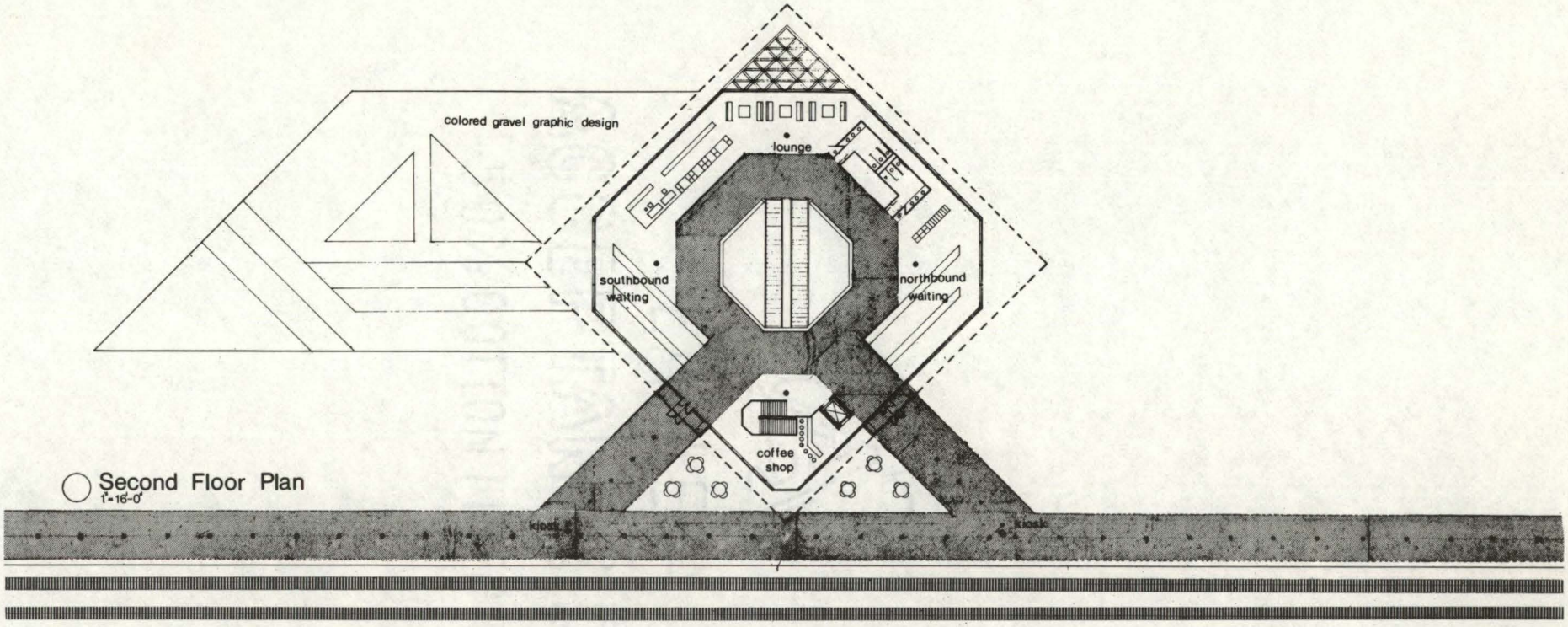
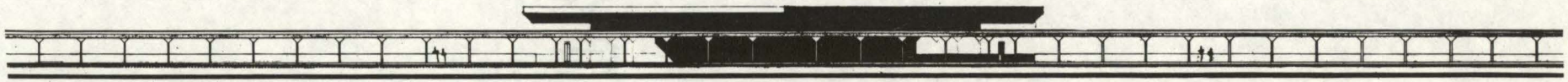


Second Floor Plan
1"=16'-0"



Trackside Elevation
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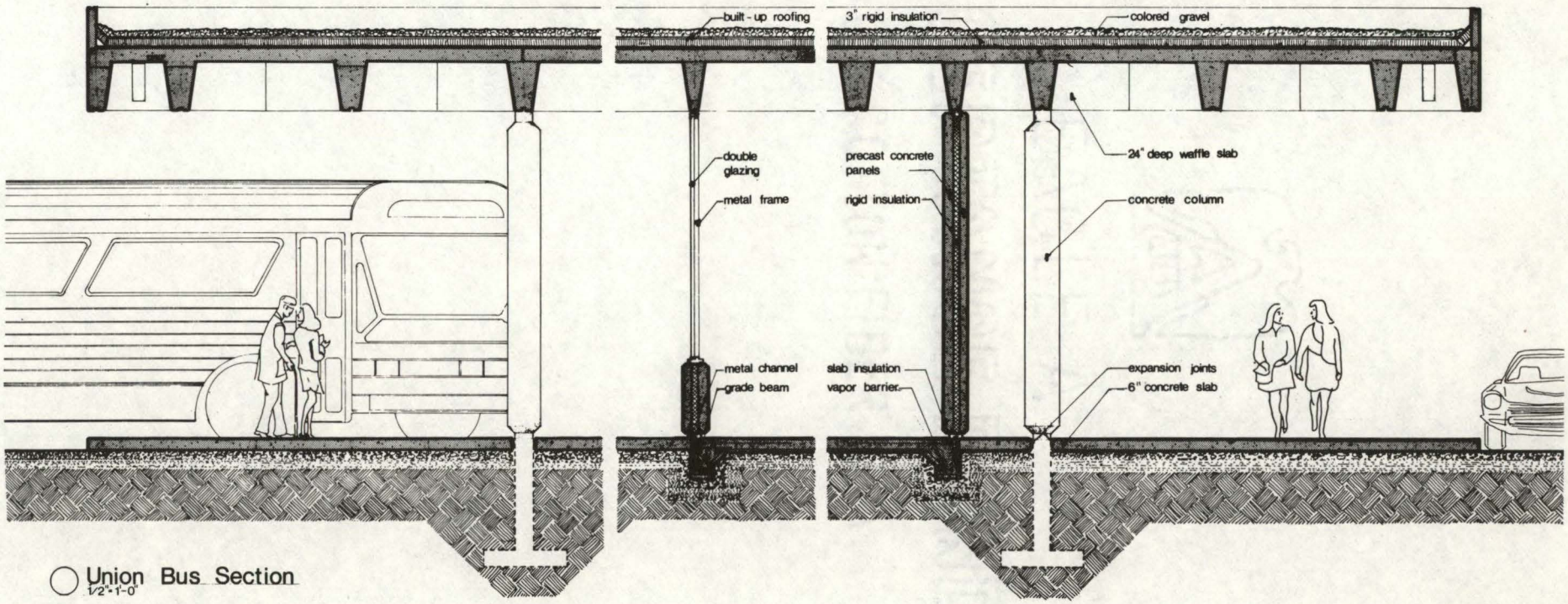
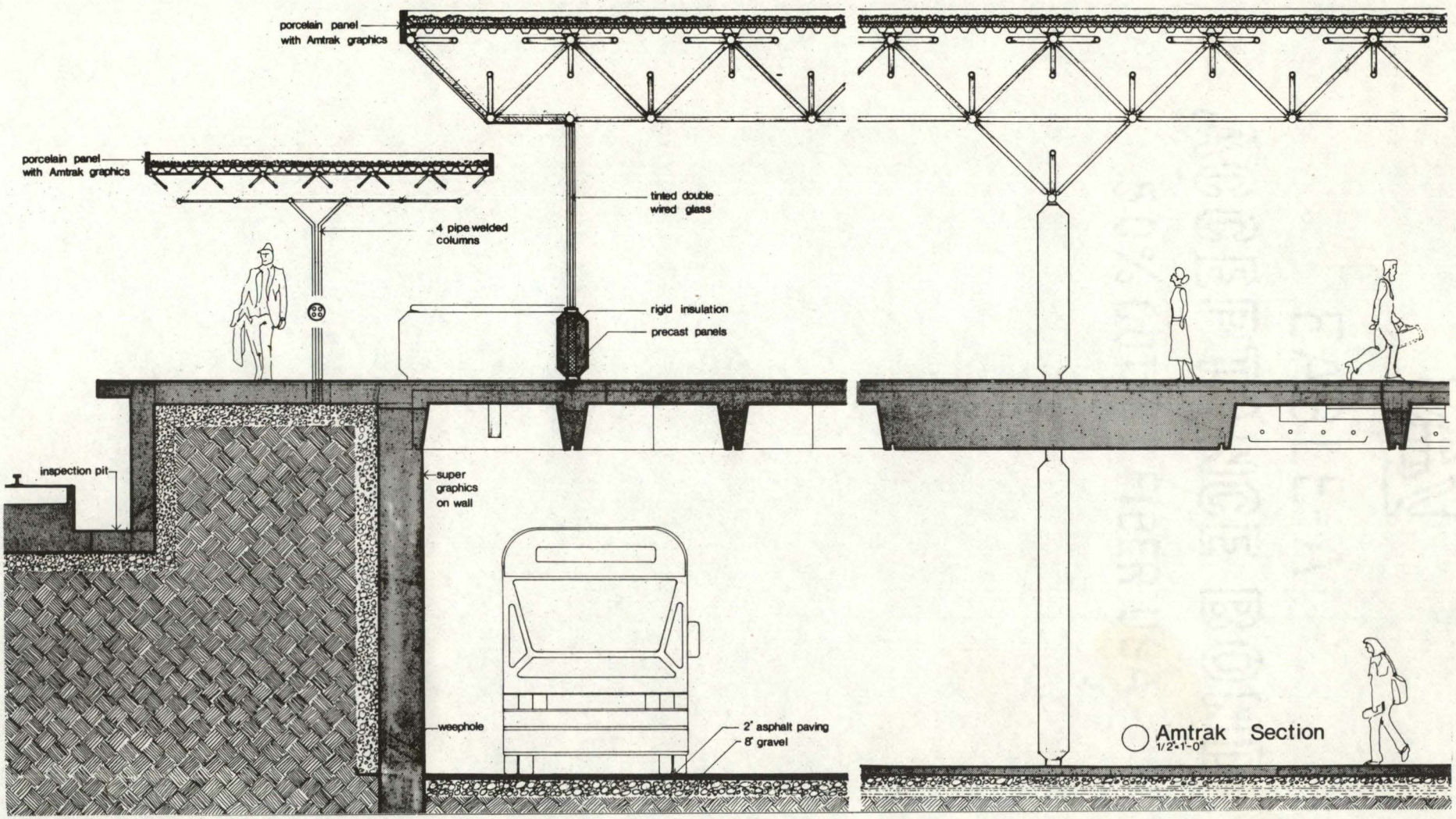
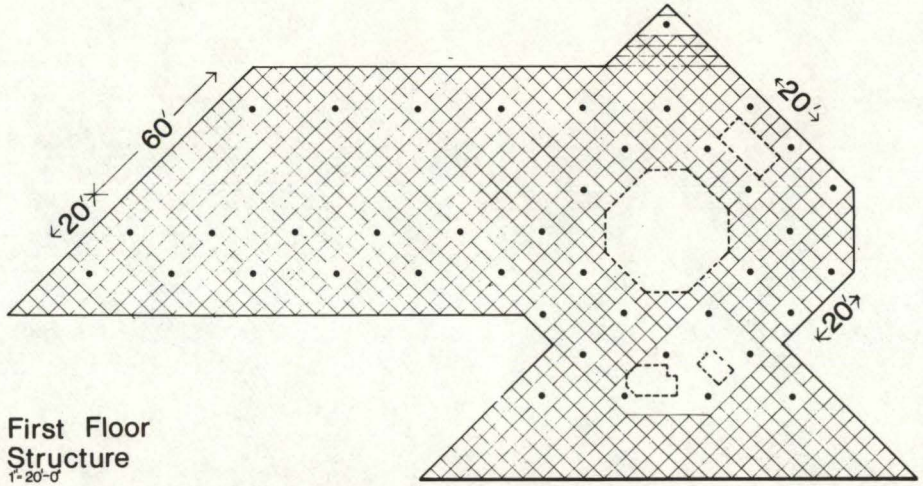
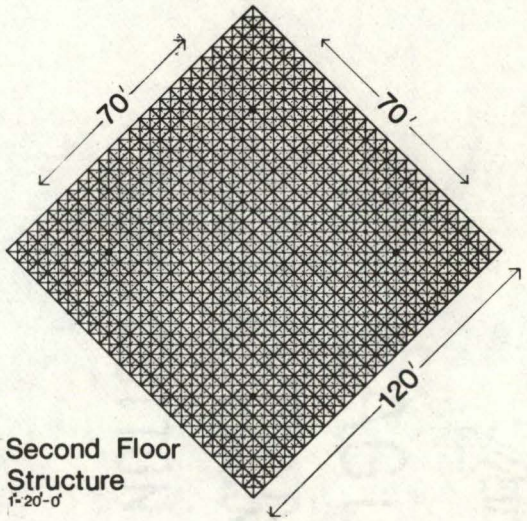


Union Bus Section
1/2"=1'-0"

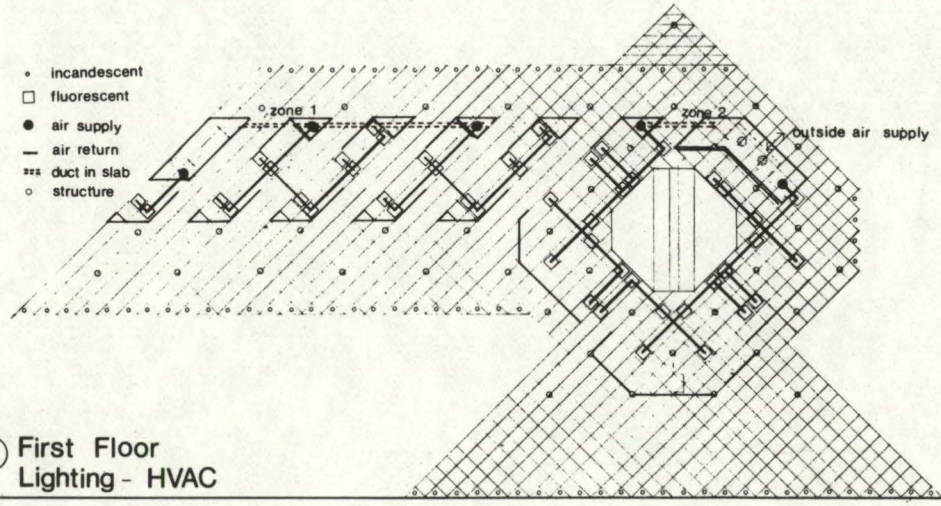

porcelain panel
with Amtrak graphics
porcelain panel
with Amtrak graphics
tinted double
wired glass
4 pipe welded
columns
rigid insulation
precast panels
inspection pit
super
graphics
on wall
weephole
2" asphalt paving
8" gravel
Amtrak Section
1/2"=1'-0"



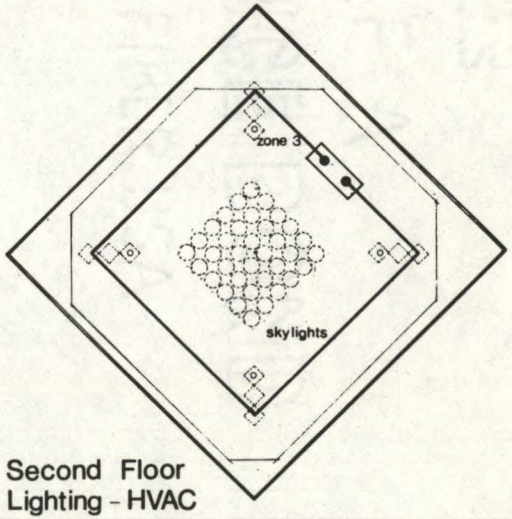
First Floor Structure
1"=20'-0"



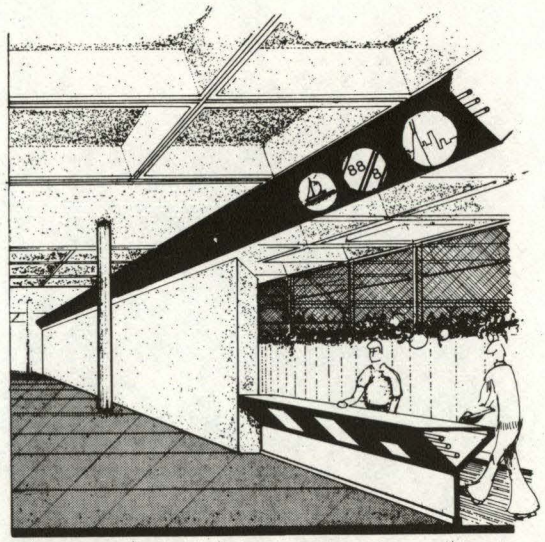
Second Floor Structure
1"=20'-0"



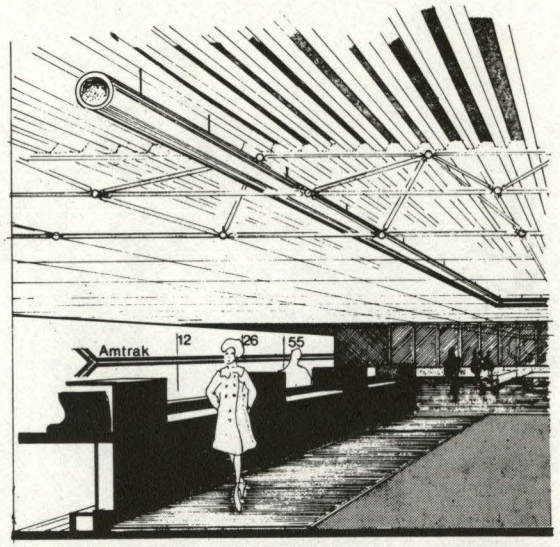
First Floor Lighting - HVAC



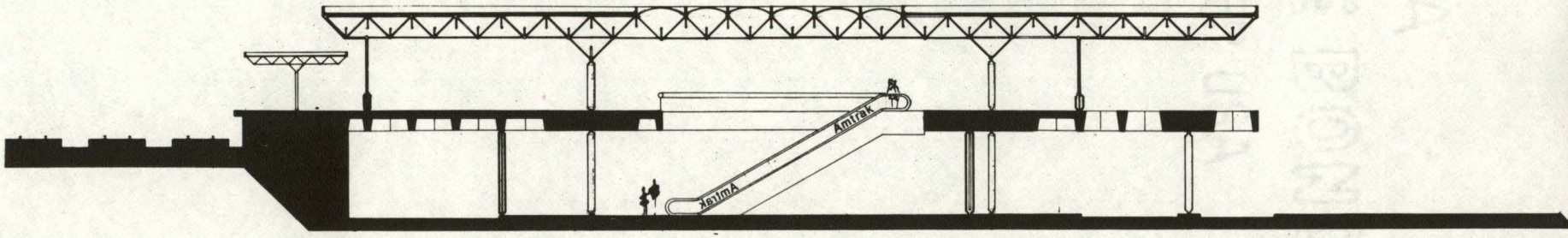
Second Floor Lighting - HVAC



Union Bus Ticket Counter

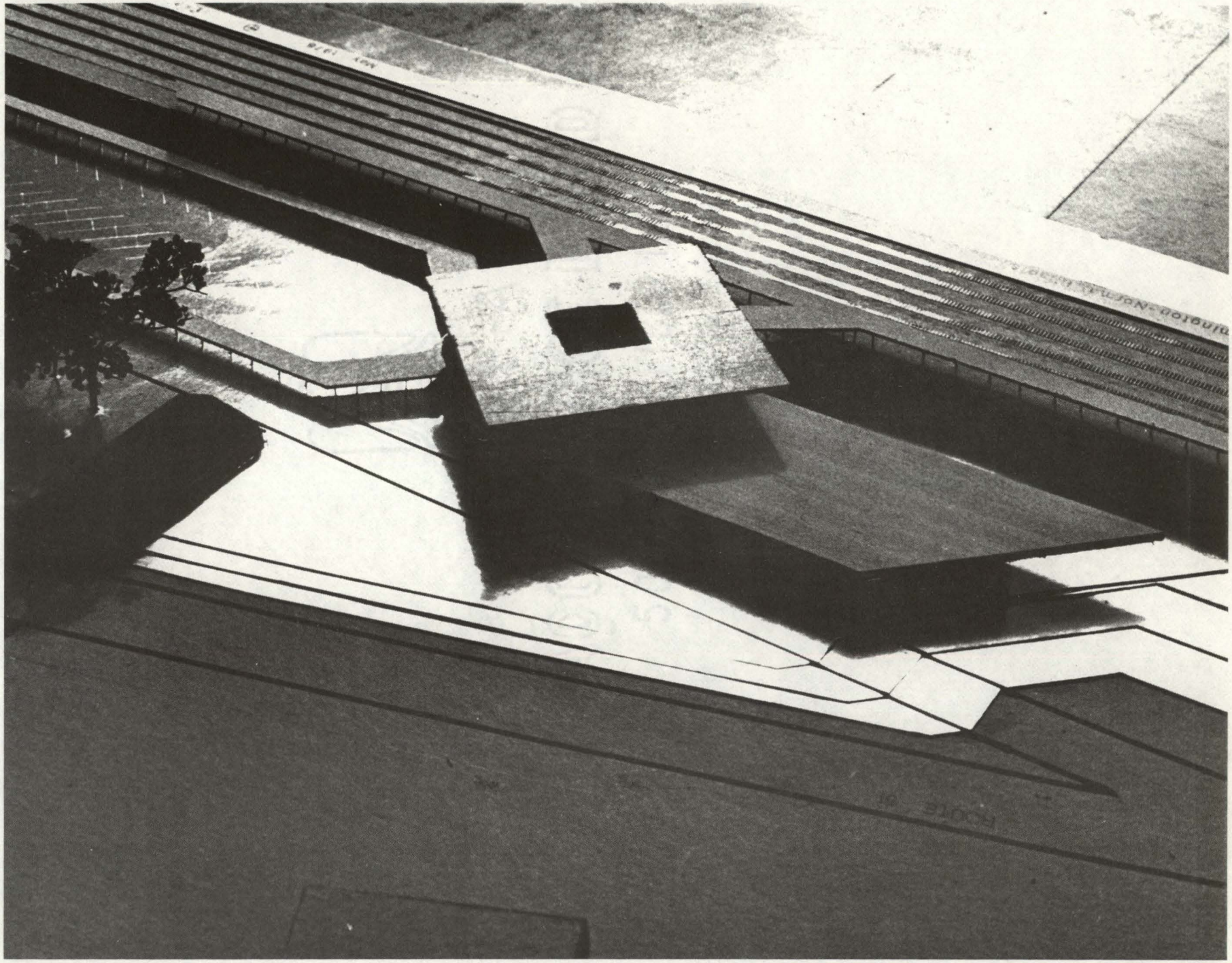


Amtrak Ticket Counter



Transverse Section

1/2"=1'0"



CONCLUSION

The Transportation Center's final form has been a result of many parameters set forth on a national, regional and local scale. The foremost of these parameters is the concept of segregation of vehicles entering the Center. On a national scale, the investigation of Amtrak's history led to the suggestion of keeping the train in a place of its own with respect to the other 6 vehicles. The problem of crossing the tracks was solved by introducing a track switch. Classifying the remaining vehicles into drop-offs and stay-awhiles was a major factor in the location of the building to accommodate the linear drop-off function.

The structure was situated on the northern portion of the site to provide good visibility from the major access road, Route 51, and to allow a safe distance from the fuel tanks located to the south.

Additional concerns were sufficient reaction time after passing under the trestle and avoidance of any interior space being located over Sugar Creek. Egress was handled with the decision to turn Virginia Avenue into a one-way, eastbound road with a traffic control device located at its intersection with Route 51.

The Center's diagonal grid configuration is a result of an effort to provide straight-forward access from the bus stalls and on the upper level to allow views up and down the tracks. The vertical parameters for design were the height of the proposed rail platform, the necessary clearance for the vehicles and the need to lift the grade level above the flood level of Sugar Creek.

The major emphasis for the Center was placed on circulation and image. The separation of the two users vertically stemmed from their request to maintain

their individual identity. This concept was further reinforced in the use of 2 major structural systems. The concrete waffle slab was used for Union Bus to convey an image of excitement yet still maintain a "friendly" posture. The two way system also acknowledges the diagonal grid. The space frame was chosen for Amtrak because of its sleek modern appearance and its long span potential. The placement of Union Bus on grade level allows for easy access and the central location of the escalators provides for a convenient transition to Amtrak from Union Bus and vice-versa.

Security is evident in the placement of ticket counters. The agent has excellent visual control over the waiting areas. Maintenance would be kept to a minimum through the use of concrete wall panels and an easy-to-clean, non-slip rubber flooring. Expansion for the bus station would occur to the north while Amtrak's expansion would occur vertically through the skylight area and then across the tracks. Energy conservation was con-

sidered by shading all glazing and well insulating the building. A neighborhood welcome fit was achieved by orienting the building to Route 51 and locating the passive functions near the adjacent residential district. Regionalism was achieved through the emphasis of the horizontal direction.

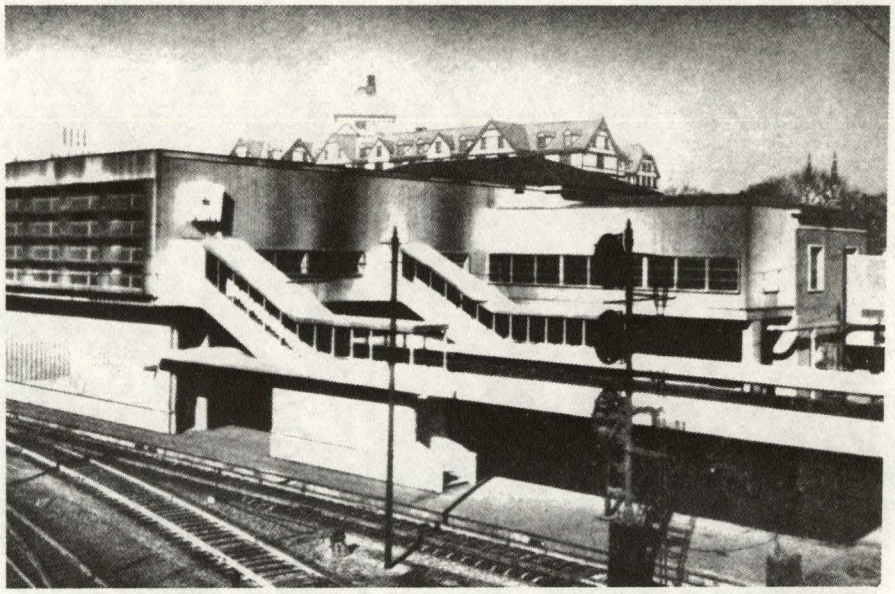
In conclusion, the form of the Center was primarily determined by the movement of people and the need to maintain separate identities for Amtrak and Union Bus Company. It should be noted that this concept is in contrast to the theory of Transportation Centers. Theoretically the Ticket, Waiting and Refreshment functions should be consolidated to promote efficient service. Strong programmatic considerations and a great desire to establish a separate image determined this contrast.

CASE STUDIES

The Three Case Studies chosen for this project are all in scale with the proposed Transportation Center for Bloomington-Normal. The Roanoke Railway Station by Allman Fordyce was chosen because it typifies a good solution to the basic problem of moving people. The Rapid Transit Station in Chicago by Skidmore, Owings, and Merrill, was selected because it combines two modes of travel, rail and bus, in an innovative manner. The third example, the Shortline Bus Terminal by Millman Associates in Providence, Rhode Island, is used because it clearly separates its functions and is especially successful in image promotion.

RAILWAY STATION
ROANOKE, VIRGINIA
ALLMAN FORDYCE, ARCHITECT

The most interesting feature of this station is its circulation system. An east-west linear concourse extends above the tracks themselves in order to assure the safe and efficient movement of people (see Figure 9). The 24' elevation change is achieved by means of escalators. Security is considered by open planning and the strategic placement of large panes of glass. The use of aluminum panels on the exterior and terrazzo floors and tile walls keep maintenance to a minimu. The image of the railroad is enhanced through the use of polished aluminum surfaces and a controlled system of graphics. Additional concern for image is evident in custom designed benches and ticket counters. In short, the clear cut expressed circulation system, complimented by careful material selection and open planning, conveys people in a manner that is convenient and pleasant.



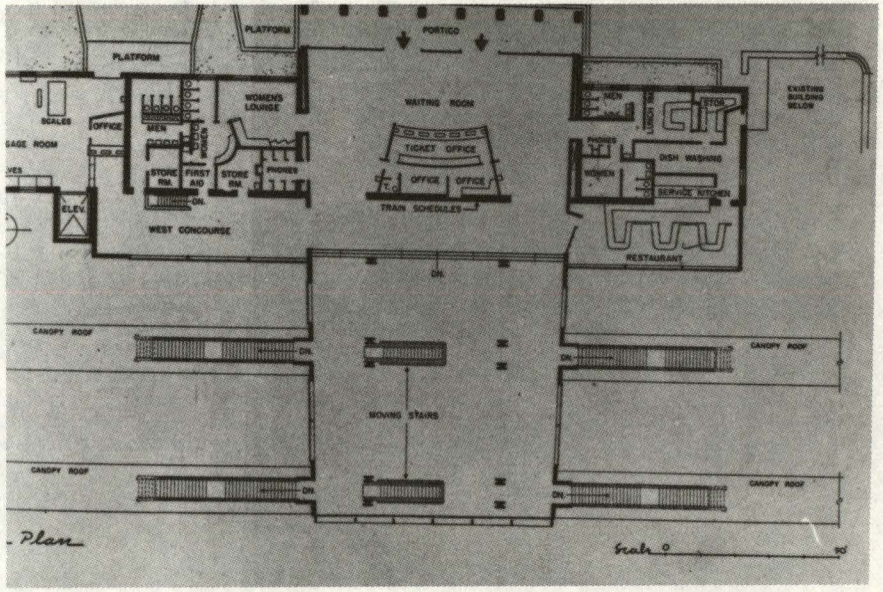
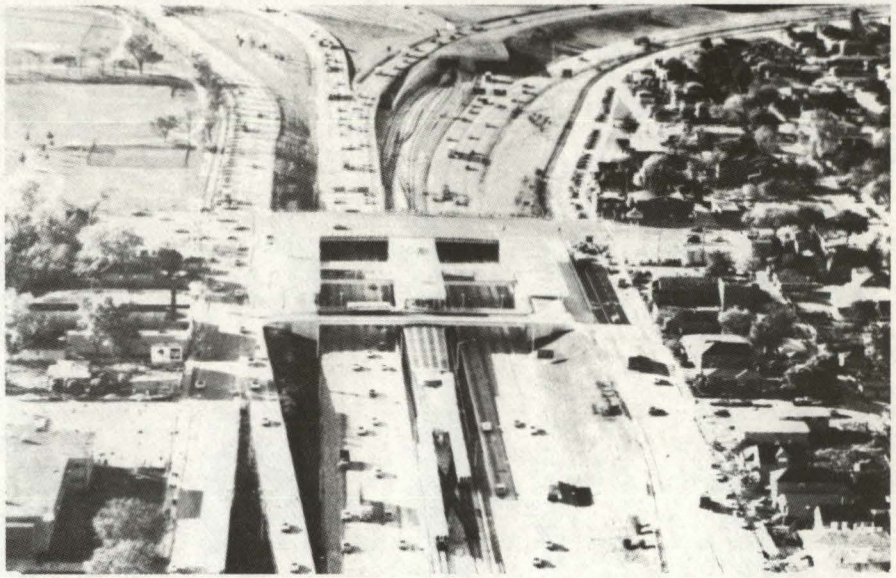


Figure 9: Roanoke Railway Station

RAPID TRANSIT STATION
CHICAGO, ILLINOIS
SKIDMORE, OWINGS, & MERRILL, ARCHITECTS

This delightful solution combining rail and bus travel has a clear straight forward circulation expression (see Figure 10). Escalators link the rapid rail platform with the ticket area above. Pedestrian bridges connect the ticket area with the bus platforms. An innovative step was taken by separating departing and arriving buses and providing a distinct bridge for buses only over the highway. Daylight and security are definite concerns as evidenced by the abundant amount of glass used. Steel canopies and a concrete floor system combine for low maintenance and high durability. The image of the rapid rail is defined through the use of crisp detailing and controlled graphics. The use of concrete arches in the rail platform area enhances spatial continuity and with the use of plastic dome skylights eliminates the



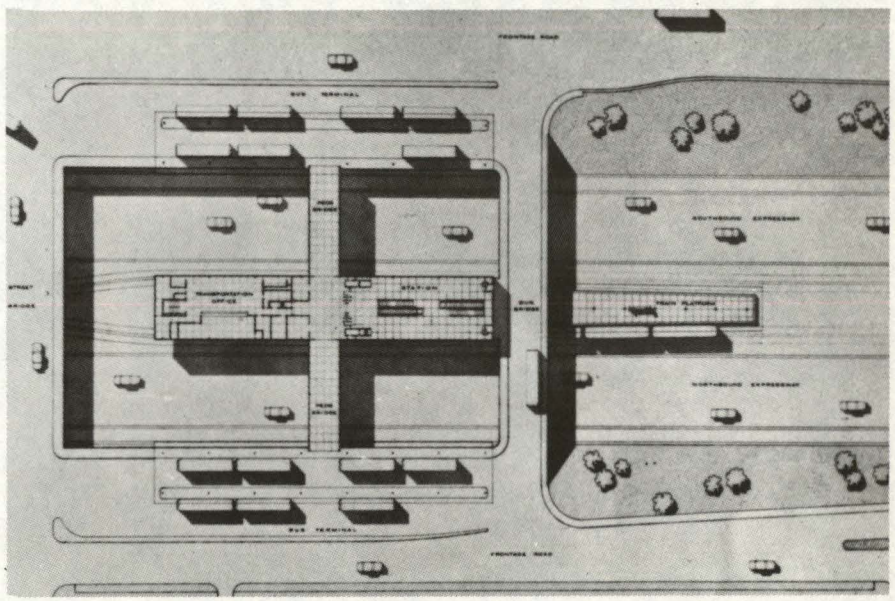


Figure 10: Chicago Rapid Transit Station

feeling of entrapment commonly experienced in underground spaces. This feature combined with careful circulation and space planning make this station successful.

SHORTLINE BUS STATION
PROVIDENCE, RHODE ISLAND
MILLMAN ASSOCIATES, ARCHITECTS

The superb function separation of functions of the station is achieved by means of three cylindrical forms. The largest contains eating facilities, the second holds offices, and the third handles baggage and a drivers' lounge. The drums welcome the pedestrian to the entrance and act as a symbol of the company's image. The image is enhanced by Malcolm Grear's graphics. The logo pylon compliments the entrance and negates the need for excessive lettering (see Figure 11). Being constructed of brick and concrete, the drums need little maintenance. The station's form presents a slight security problem, but their radii are large enough to allow sufficient pedestrian foresight. The station acknowledges bus flow with 45^{o} diagonal stalls. Through the use of functional separation and expression, and a conscious effort towards progressive imagery the Short Line Bus Station is a welcome fit into the Providence Downtown.

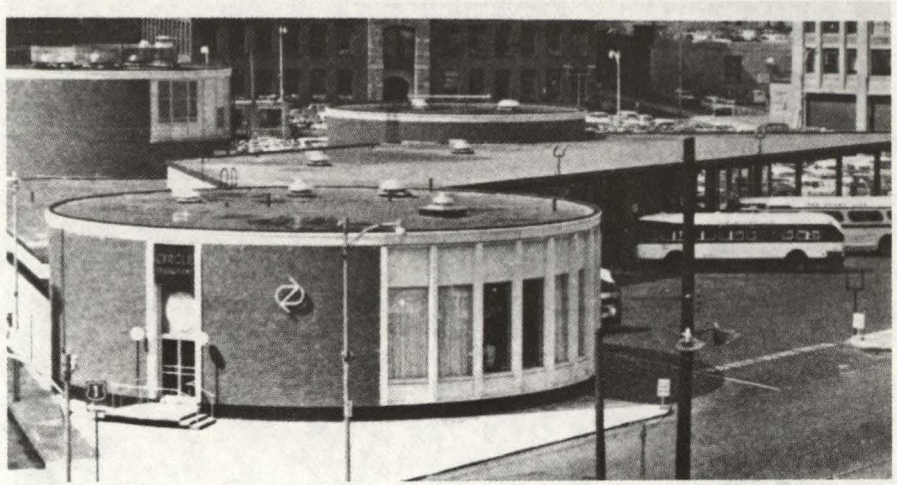


Figure 11: Providence Bus Station

APPENDIX

Outbound Flow as Determined by Ticket Sales from Present Bloomington Stations

1977	January	3,565
	February	4,338
	March	3,073
	April	5,217
	May	4,036
	June	3,778
	July	3,912
	August	5,196
	September	4,831
	October	4,576
	November	5,304
	Average	4,347

Actual working figures would be double this figure or an average of 8,694. This is due to patrons with round trip tickets not purchasing tickets at the Bloomington Station.

Source: Conversation with Mr. Don Crimmin, Superintendent, Mid-West Corridor - Amtrak December 19, 1977.

APPENDIX

SITE DATA CHECKLIST

Physical Data

1. Underlying geology 50-75 inches of Loess
2. Soil type - mixture of rock, sand, silt, clay and gravel

Water

1. Existing water body: Sugar Creek, flowing westbound
2. Drainage channels: Sugar Creek, varied flow depending on season from
3. Drainage Pattern: towards center of site
4. Water Table: Flood level at 761

Topography

1. Contours: low 744' at Sugar Creek
   median 760' over majority of land
   high 776' at top of track
2. Slope: 1 in 6 slope from track level
3. Visibility: Excellent from all points east
4. Circulation: Major Access: proposed Route 51
   3 lanes southbound, 25 MPH limit
   Minor Access: Virginia Avenue west westbound
   Major Egress: Virginia Avenue eastbound
   Minor Egress: Route 51 southbound

Climate

1. 1977 High Temperature 98° July
   1977 Low Temperature -21° January
2. Wind nearly constant breeze from West
   Major storms arrive from North-West
3. Sound levels
Automotive	82 dB
Trucks	82 dB
Rail	91 dB

Ecology

1. No significant trees
2. No significant plant life
3. No animal communities

Man-made Structures

1. Railroad bridge spanning Sugar Creek
   12' high steel beam resting on concrete abutment
2. Adjacent buildings:
   - Steak 'n Shake - east
   - vacant - north
   - vacant - west
   - Lincoln Oil Co. - south and residences
3. Utilities
   - water under centerline of Virginia Avenue
   - electricity utility line at corner of Virginia and Madison Avenues
   - sanitary 33" brick line running NE to NW
   - storm - Sugar Creek

FOOTNOTES

INTRODUCTION

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1 Association of Commerce and Industry of McLean County, "Major Employers of McLean County," August, 1977, p. 9.

2 Encyclopedia Britannica, Inc. Volume II, 1973, p. 575.

3 Ibid, p. 1086.

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1 Creighton, Roger L. Urban Transportation Planning, p. 19

2 Ibid, pp. 6-13.

3 The Highway Transportation Fact Finder

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Meeks, Carroll L. V., The Railroad Station: An Architectural History. New Haven, Connecticut, Yale University Press, 1956.

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"Amtrak" Mass Transit, Volume II, Number 9, October, 1975.

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5. Union Bus

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6. Transportation and Planning in Bloomington-Normal

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1. Englund, Jr., Carl R. A Review of Amtrak Station Location Studies at Bloomington, Illinois, January, 1975.

2. McLean County Regional Planning Commission, Natural Resources of McLean County, December, 1970.

3. Lynch, Kevin, Site Planning, 2nd Edition, MIT Press, 1971.

4. Lynch, Kevin, The Image of the City, MIT Press, 1960.

5. Conversations with Mr. Mike Lammey, Transportation Planner - McLean County Planning Commission, Fall - Spring, 77-78.

6. Conversations with Mr. Wilson Kirby, City Manager, town of Normal, Winter, 1977.

7. Conversation with Mr. Paul Dent, Engineer-Inspector, Illinois Central Gulf Railroad, Winter, 1977.

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1. De Chiara, Joseph, Time-Saver Standards for Building Types, McGraw-Hill, Inc., 1973.

2. Skidmore, Owings and Merrill, Design Manual, Vol. II, Architectural Design Standards: Stations, July, 1977.

3. Interview with Mr. Kenny Brown, Skidmore, Owings and Merrill, Fall, 1977.

4. Conversation with Mr. Curt Williard, Skidmore, Owings and Merrill, Fall, 1977.